

## FASTENING DEVICE FOR A RADIATOR

### BACKGROUND OF THE INVENTION

#### 1. Field of the invention:

5       The present invention relates to a fastening device for a radiator and particularly to a fastening device, with which the radiator can be properly attached to a heat generating unit.

#### 2. Brief Description of Related Art:

10       The central processing unit (CPU) has increased the operation speed largely and the working temperature thereof increases along with the operation speed. Hence, it is necessary to provide a more efficient cooling device for performing sound effect of heat dissipation.

15       The conventional cooling device mostly includes a radiator, a cooling fan, which is disposed on the radiator to produce air current and obtain convection effect, and a retaining tool for the radiator being able to be fixedly attached to the CPU.

20       Further, Taiwan publication No. 562158, entitled "fixing device for cooling fins of CPU", includes a frame base, a lower plate and a fixing piece. The frame base, which is provided with a rectangular shape, is disposed on the main board to surround the CPU with cooling fins. The cooling fins at the bottoms thereof contact the surface of the CPU and the lower plate is disposed at the bottom of the CPU and has two posts piercing the main board and the frame base respectively. The fixing piece is flat and disposed to be spaced on the cooling fins and two ends thereof engages with the two posts by way of a screw thread rod respectively.

30       However, the preceding prior art has a problem needed to overcome while in use. Because it is necessary to provide a groove for locating the retaining tool, the structure and shape of the radiator is restricted due to the retaining tool. Hence, the cooling area is reduced and it is unable to perform the heat dissipation effectively.

Further, a radiator 11 shown in Figs. 1 and 2, is mounted on the base plate 12 above the CPU and the radiator 11 has at four corners thereof a through hole 112 respectively for being inserted with a spring 142 and pierced with a screw 141 for engaging with engaging holes 121 of the base plate 12 such that the radiator can be attached to the base plate 12 and keeps contact with the CPU 13. The spring 142 is located between the screw 141 and the radiator 11 to offer a proper pressure urging the radiator while the screw 141 is fastened to the base plate 12 to prevent the engaging holes 112 and the base plate 12 from damage due to excessive fastening force exerted to the screw 141 or prevent the radiator 11 from excessively squeezing the CPU 13 and resulting in the CPU breaking.

But, a problem of the preceding way for fixing the radiator resides in that the screw 141 and the spring 142 are separately packed from delivering and it is very easy for the screw 141 or the spring getting lost. Even more, the spring 142 being utilized in addition to the screw 141 makes the cost of the integral product increasing so that there is no economic effect for the preceding type of fixing device.

## SUMMARY OF THE INVENTION

An object of the present invention is to provide a fastening device for a radiator in which the secure part thereof is processed with heat treatment so as to generate pressure adjustment during fastening.

## BRIEF DESCRIPTION OF THE INVENTION

The detail structure, the applied principle, the function and the effectiveness of the present invention can be more fully understood with reference to the following description and accompanying drawings, in which:

Fig. 1 is an exploded perspective view of the conventional fastening device for a radiator;

Fig. 2 is an assembled perspective view of the conventional fastening device shown in Fig. 1;

Fig. 3 is an exploded perspective view of a fastening device for a radiator according to the present invention in company with the radiator and a base plate;

Fig. 4 is an assembled perspective view of the fastening device with the radiator and the base plate; and

Fig. 5 is a side view illustrating the fastening device fixing the radiator to the base plate.

#### DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring to Figs. 3 and 4, a fastening device according to the present invention is used for fastening a radiator 23 to a base plate 24 and the fastening device at least includes a locating part 21 for bearing and locating the radiator 23. The locating part 21 has an opening 211 and a secure arm 22 extends from four corners of the locating part 21 respectively. Each of the secure arms 22 has an engaging hole 221 respectively. The secure arms 22 are processed with heat treatment so that the secure arms 22 are provided with a feature of elasticity.

The engaging hole 221 in each of the secure arms 22 is used for being passed through with a fastener and the fastener in the embodiment is a threaded fastening component 25. The radiator 23 has a base 231, which is provided with a size corresponding to the opening 211, and a plurality of cooling fins 232 are fixedly attached to the base 231. Further, a guide heat tube 233 passes through the cooling fins 232 and connects with the base 231.

During the radiator is fixed to the base plate 24, the base 231 of the radiator 23 is arranged to fit with the opening 211 of the locating part 21 and then the locating part 21 with the radiator 23 is mounted on the surface of the base plate 24, which is attached on a heat generating unit. The threaded fastening component 25 is arranged to pass through

the engaging hole 221 of each of the secure arms 22 and fastened to engaging holes 242 of the base plate. In this way, the base 231 of the radiator 23 can contact the surface of the heat generating unit 241 properly to access the heat dissipation function.

5 Referring to Figs. 3 and 5, during engaging with the threaded fastening component 25, a contact pressure between the radiator 23 and the heat generating unit 241 can be formed because of the secure arms 22 providing a property of heat treated elasticity to prevent the base plate 24, the secure arms 22 or the heat generating unit from damage  
10 due to excessive fastening force of the threaded fastening component 25.

Further, the fastening device of the present invention is fixedly attached to the bottom of the radiator 23 and the structure and the shape of the radiator are not possible to be limited by the fastening device  
15 so that the fastening device of the present invention is capable of being used for radiators in different shapes and structure. Hence, it is not necessary to use springs and screws for fastening the radiator so that it can lower the production cost and the problem regarding lost of springs and screws can be solved naturally.

20 While the invention has been described with referencing to a preferred embodiment thereof, it is to be understood that modifications or variations may be easily made without departing from the spirit of this invention, which is defined by the appended claims.